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|---|---|
| **From:** | MCCLINCY Matt |
| **To:** | Harry Craig/R10/USEPA/US@EPA; Sean Sheldrake/R10/USEPA/US@EPA |
| **Cc:** | Rene Fuentes/R10/USEPA/US@EPA; Chip Humphrey/R10/USEPA/US@EPA; HAFLEY Dan |
| **Subject:** | RE: Perchlorate Pilot Test Workplan - electronic copy |
| **Date:** | 08/03/2006 04:45 PM |

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Thanks Harry,

I really appreciate you making the time to review the work = plan.

Also, I added a couple of notes below to your comments to give = you a sense of what our take is.

Matt

I. General Comments

1. A groundwater preliminary remediation goal (PRG) for = perchlorate and chlorate was not identified in the test plan. Establishing = groundwater PRGs for the pilot test provides an objective measure of whether in-situ bioremediation may be a potentially viable remediation option for this = site.

Noted and will incorporate the = comment. Even if the technology is not able to achieve the 4 to 5 order of = magnitude reduction necessary to meet the PRG, we will still want to consider = implementing it in conjunction with hydraulic containment to reduce the mass or = toxicity of the plume that is being contained.

2. Based on the results of the laboratory scale treatability = study, bioaugmentation and electron donor addition are required to demonstrate biodegradation = of aqueous phase perchlorate at this site. Elevated pH and chloride concentrations appear to have inhibitory effects on the degradation of = perchlorate. Based on the degradation pathways of perchlorate and chlorate outlined = in Figure 4, chloride concentrations in the aquifer would be expected to = increase even further due to biological degradation. Chlorine dioxide = additions may also be necessary to control potential biofouling of injection = wells.

Acknowledged -the plan notes = this. In the scheme of things, we are looking at an increased environmental = benefit from reducing perchlorate versus slight increases in chloride. The field = pilot will prove out whether they can get bioremediation going in-situ or whether = the site conditions are too = toxic for in-situ

bioremediation.

3. Given the significant spatial heterogeneity of perchlorate, chlorate, and chloride concentrations in groundwater, and presumably = microbial heterogeneity, consideration should be given to also pilot testing = ex-situ bioreactors for perchlorate degradation, where control or adjustment of = the four limiting factors listed above could be more easily = accomplished. It addition, ex-situ treatment is less likely to experience biofouling of = treated effluent re-injected into the aquifer or discharged into surface = waters.

I will pass along the = comment. However, Arkema is probably only going here as a last resort. If, = ok Sean when a wall goes in J, they are going to have to pump and treat some = groundwater, and they will have to treat the groundwater. I definitely see this = type of system as one of the treatment options. The main reason Arkema = has not pursued ex-situ treatment is that they will have to construct a = desalinization plant to deal with the salt. They might go here willingly if they feel = they have taken a reasonable shot at the alternatives. Prior to this it = will be a court battle for sure.

4. Some previous research has shown the ability of perchlorate = reducing microorganisms (PRM) to degrade perchlorate in high salinity = environments (Logan et al. 2001). Consideration should be given to testing PRM = for bioaugmentation using consortia adapted to high salinity environments, given the = elevated levels of chloride that exist in groundwater at the former Atofina = site.

Great comment.

5. Consideration should be given as to how in-situ = bioremediation of perchlorate in groundwater would be implemented in conjunction with a soils source = control for perchlorate. Although the perchlorate soil PRG of 100 mg/kg identified in test plan may be protective for a direct contact soil = industrial exposure scenario, soils containing perchlorate at 100 mg/kg or below = may be a substantial on-going source of perchlorate leaching into the aquifer, as = the soil/water partitioning coefficients (Kd) for perchlorate are very, very = low (Kd ~ 0.1 to 0.01), and essentially functions as an unreactive tracer in the subsurface (Urbansky and Brown 2003, Tipton et al. = 2003).

We absolutely agree, and already = highlighted this issue in our comments on the draft hot spot evaluation. The = vadose zone source issue is not limited to perchlorate and is a significant = concern for a number other upland contaminants (e.g., hex chrom, chlorobenzene, = and DDT) DEQ considers vadose zone soils that could leach contaminants at = levels that could impact the beneficial use of

groundwater to be hot spots of contamination. These are carried into the feasibility study with a preference for removal or treatment. We will certainly use the = Perchorate Pilot Plan as another opportunity to repeat this comment. =

On the whole, we see the pilot as = having value for the source control alternatives evaluation, EE/CA and the = upland FS.

Thanks again for your = review.

Matt

II. References:

1. Logan, B.E., J. Wu, and R.F. Unz, Biological Perchlorate = Reduction in High-Salinity Solutions, Water Research, Vol. 35, No. 12, pp. = 3034-3038, 2001.

2. Urbansky, E.T. and S.K. Brown, Perchlorate Retention and = Mobility in Soils, Journal of Environmental Monitoring, Vol. 5, pp. 455-462, = 2003.

3. Tipton, D.K., D.E. Rolston, and K.M. Scow, Transport and Biodegradation of Perchlorate in Soils, Journal of Environmental = Quality, Vol. 32, pp. 40-46, 2003.

Just

-----Original Message-----
From: Craig.Harry@epamail.epa.gov [mailto:Craig.Harry@epamail.epa.gov] =
Sent: Thursday, August 03, 2006 12:49 PM
To: MCCLINCY Matt; Sheldrake.Sean@epamail.epa.gov

Cc: Fuentes.Rene@epamail.epa.gov; Humphrey.Chip@epamail.epa.gov
Subject: Fw: Perchlorate Pilot Test Workplan - electronic = copy

Matt, Sean,

Attached are my comments on the Atofina treatability test plan, = and the references cited. Let me know if you have any questions or comments.

Regards,

Harry

(See attached file: = Atofina-Perchlorate-InSituTestPlan-EPAComments.doc)
(See attached file: = Perchlorate-BiodegradationInHighSalinityWaters.pdf)
(See attached file: = Perchlorate-Retention&MobilityInSoils.pdf)(See attached file: = Perchlorate-Transport&BiodegradationInSoils.pdf)

----- Forwarded by Harry Craig/R10/USEPA/US on 08/03/2006 12:42 = PM -----

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Matt,

Thanks for sharing with us; hopefully Harry will have time for = a detailed review. In my quick review, you can guess I am = concerned about the vadose zone soils. I see a significant source area = remains, and EPA would strongly urge that it be dug up and disposed of offsite; = without removal of the source area, no treatment system can deal with a = source area that remains, no matter how reliable the chemistry and how = good reaction reversability (or lack thereof) looks. If I misunderstood the lack of source term removal or overlooked plans for its removal, = let me know.

S

Sean Sheldrake

USEPA

Environmental Cleanup Office

1200 Sixth Avenue

Mailstop: ECL-110

Seattle WA 98101-1128

sheldrake.sean@epa.gov

Phone: 206/553-1220 / Fax: 206/553-0124 or = -0910

http://yosemite.epa.gov/r10/oea.nsf/webpage/dive+team

http://yosemite.epa.gov/r10/cleanup.nsf/sites/ptldharbor

Deliveries: 9th floor mailroom

Visitors: Check-in @ PERC / Service Center on 12th = floor

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= ; 07/28/2006 02:25 Sean Sheldrake/R10/USEPA/US@EPA

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Harry,

Attached is a copy of the Arkema draft pilot plan. I am = planning on getting comments out by the end of next week. DEQ would = certainly welcome any comments you have if you get any opportunity to look = at it before then.

Sean, I cannot remember if I forwarded this to you for your = records. If not, here it is.

Matt McClincy

-----Original = Message-----

From: Todd SLATER [mailto:todd.slater@total.com]

Sent: Tuesday, July 11, 2006 5:13 = AM

To: MCCLINCY = Matt

Subject: Fw: Perchlorate Pilot = Test Workplan - electronic copy

Matt,

Attached is the Active Pilot Test = Work Plan from Geosyntec. You should also receive a hard copy today. If you need additional hard copies let me = know.

Todd

Todd Slater
Legacy Site Services = LLC
468 Thomas Jones = Way
Exton, PA = 19341-2528

Office: (610) = 594-4430
Cell Phone: (610) = 804-0506
Fax: (610) = 594-4439
email: = todd.slater@total.com
----- Forwarded by Todd = SLATER/INT/CHEM/Corp on 07/11/2006 08:10 AM -----

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07/10/2006 05:30 PM <todd.slater@total.com>, &= nbsp;
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Todd and Larry,

Please find attached an = electronic copy of the perchlorate pilot test workplan for your use, and = to forward to ODEQ.

Hard copies of this workplan have = gone out to Matt McClincy of ODEQ and to each of you in this evening's courier.

Regards,

Hester[attachment "Arkema = Active Pilot Test Workplan FINAL 8 July 2006.pdf" deleted by Sean Sheldrake/R10/USEPA/US]